

REMARKS

Favorable reconsideration of the application is respectfully requested in light of the amendments and remarks herein.

Upon entry of this amendment, claims 1–5, 7–8, 10–14 and 16–21 will be pending. By this amendment, claims 1, 3, 8, 11, 17–18, and 21 have been amended; and claims 6, 9, and 15 have been canceled. No new matter has been added.

§102 Rejection of Claims 1–18 and 21

On page 2 of the Office Action of June 5, 2006 (hereinafter referred to as “the Office Action”), claims 1–18 and 21 stand rejected under 35 U.S.C. §102(e) as being anticipated by Marx (U.S. Patent No. 6,175,632; hereinafter referred to as “Marx”).

In the Background of the Specification, it was indicated that “[o]ne of the challenges in creating music collages on computer systems is that music is recorded in a wide range of different tempos. Understandably, music that is recorded at one tempo does not sound good when mixed with music recorded at another. Thus, knowing the tempo and downbeat is important in the creation and editing of music. Nevertheless, music recordings on compact discs (CD), tapes, or other media, generally do not include information on tempo in the recorded signal. It is, therefore, difficult (if not impossible) to properly mix musical media with other musical recordings without having tempo information. Thus, there is a need for a system for and a method of determining the period of recurring events within a recorded signal. Further, there is a need to precisely identify tempo of a recorded signal so that multiple recorded signals can be successfully mixed together. Even further, there is a need to synchronize musical loops and other musical media to any song and to other time based events such as video, animation, lights,

or other timing critical devices.” *Background of the Specification, page 2, lines 5–19.* (emphasis added)

To solve the above-described problems as to mixing multiple recorded signals and synchronizing musical loops and other musical data to a song, embodiments of the present invention include methods and systems for precisely identifying tempo in a recorded signal by determining a period of recurring events in the recorded signal.

For example, the method of claim 1, as presented herein, includes at least:

- determining a period of recurring events within a recorded signal, the period of recurring events providing a measurement of a tempo of the recorded signal, said determining comprising:

- establishing an anchor point in the recorded signal, the anchor point being indicative of a beginning point for a period of recurring events in the recorded signal;

- determining a length for the period of recurring events in the recorded signal by digitally comparing a first portion of the recorded signal starting from the established anchor point with at least one different portion of the recorded signal subsequent to the anchor point, said at least one different portion extrapolated from the first portion; and

- refining the length for the period of recurring events by digitally comparing a pattern included by the first portion with patterns included by said at least one different portion subsequent to the anchor point, each subsequent portion having the length of the first portion.

(emphasis added)

Accordingly, in one aspect of claim 1, the method is characterized by *determining a length for the period* of recurring events in the recorded signal by digitally comparing a first portion of the recorded signal starting from the established anchor point with at least one different portion of the recorded signal subsequent to the anchor point, the at least one different portion extrapolated from the first portion. *See Specification, paragraph 38.* That is, the period

is determined by comparing data representing a portion of the recorded signal with other data representing different portions of the *same recorded signal*.

By contrast, once Marx has found sound impacts for some part of the audio signal, Marx cycles through various predetermined beat-per-minute (BPM) possibilities to determine a “best fit” for the audio signal. In doing so, Marx appears to compare a portion of the audio signal with a variety of predetermined linear time grids, each associated with a specific tempo (i.e., BPM), each inherently defining a period duration. However, these BPM patterns are extrinsic to the audio signal and do *not* constitute another portion of *same* audio signal. Marx therefore fails to teach or suggest determining a length by digitally comparing a first portion of the recorded signal starting from the anchor point with at least one different portion of the (same) recorded signal subsequent to the anchor point.

In a further aspect of claim 1, the method is characterized by *refining the length for the period* of recurring events by digitally comparing a pattern included by the first portion with patterns included by said at least one different portion subsequent to the anchor point, each subsequent portion having the length of the first portion.

By contrast, Marx is cited in the Office Action, in pertinent part, for disclosing that a “detector device 14 sums a number of the matches of the sound impacts with at least one [of] the note pattern and a number of patterned matches to compare the sums, after scaling, as hereinafter described. The detector device determines the BPM to be the BPM that has a high scaled sum of matches of the sound impacts 70 that have a large magnitude to the note pattern.” *Marx, Col. 9, lines 32–39*. The method taught by Marx apparently involves aligning sound impacts derived from the audio signal with predetermined BPM note patterns (i.e., linear time grids, as discussed above), and scoring most highly the BPM note pattern that best fits to the sound impacts. That

is, Marx does not compare a portion of the audio signal with other, different portions of the same audio signal, but instead compares a portion of the audio signal with a variety of predetermined patterns extrinsic to the audio signal.

Marx is further cited for disclosing that a more, or less, precise application may be performed by using respectively more, or fewer, iterations or by utilizing shorter time intervals or more complete counting of matches. *See Marx, Col. 11, lines 34–44.* Marx appears to indicate here only that a more rigorous application of his method will yield more precise results, and a less rigorous application will yield less precise results. Marx therefore fails to teach or suggest digitally comparing a pattern included by the first portion (of a recorded signal) with patterns included by said at least one different portion (of the same recorded signal) subsequent to the anchor point, each subsequent portion having the length of the first portion.

In summary, the embodiments of the present invention are configured to solve problems in mixing multiple recorded signals and synchronizing musical loops and other musical data to a song by determining a period of the recorded signal and refining the length of the period by comparing portions of the recorded signal with other, different portions of the same recorded signal. Marx seeks instead a “best fit” between of a portion of an audio signal with various predetermined BPM note patterns, where the predetermined BPM note patterns are extrinsic to the audio signal, not part of it.

Based on the foregoing discussion, claim 1 should be allowable over Marx. Since claims 11, 18 and 21, as amended herein, recite substantially similar limitations as recited in claim 1, claims 11, 18 and 21 should also be allowable over Marx. Further, since claims 2–5, 7–8, 10, 12–14 and 16–17 depend from one of claims 1 and 11, claims 2–5, 7–8, 10, 12–14 and 16–17 should also be allowable over Marx. Claims 6, 9, and 15 have been canceled by this amendment.

Accordingly, it is submitted that the rejection of claims 1–18 and 21 based upon 35 U.S.C. §102(e) has been overcome by the present remarks and withdrawal thereof is respectfully requested.

§103 Rejection of Claims 19 and 20

On page 5 of the Office Action, claims 19–20 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Marx as applied to claim 18 above, and further in view of Kraft (previously cited).

Based on the foregoing discussion regarding independent claim 18, and since claims 19–20 depend from claim 18, claims 19–20 should also be allowable over Marx.

The Office Action states that “Kraft teaches a system that analyzes input audio signals and converts them to human readable notation (Col. 5, lines 16-35). Kraft teaches the use of various other programs, which can display portions of an audio signal in a graphical user interface.” *Office Action, page 6, lines 3–6*. Even if Kraft does disclose, as suggested, the use of programs that can display portions of an audio signal in a graphical user interface, Kraft fails to teach or suggest *determining a length for the period* of recurring events in the recorded signal by digitally comparing a first portion of the recorded signal starting from the established anchor point with at least one different portion of the recorded signal subsequent to the anchor point, the at least one different portion extrapolated from the first portion; and *refining the length for the period* of recurring events by digitally comparing a pattern included by the first portion with patterns included by the at least one different portion subsequent to the anchor point, each subsequent portion having the length of the first portion. Therefore, it is maintained that Marx and Kraft, in combination or individually, fail to teach or suggest all the limitations of the

processing system as claimed in claims 19 and 20.

Accordingly, it is submitted that the rejection of claims 19–20 based upon 35 U.S.C. §103(a) has been overcome by the present remarks and withdrawal thereof is respectfully requested.

Conclusion

In view of the foregoing, applicants respectfully request reconsideration of claims 1–5, 7–8, 10–14 and 16–21 in view of the remarks and submit that all pending claims are presently in condition for allowance.


In regard to the claims amended herein and throughout the prosecution of this application, it is submitted that these claims, as originally presented, are patentably distinct over the prior art of record, and that these claims were in full compliance with the requirements of 35 U.S.C. §112. Changes that have been made to these claims were not made for the purpose of patentability within the meaning of 35 U.S.C. §§101, 102, 103 or 112. Rather, these changes were made simply for clarification and to round out the scope of protection to which Applicant is entitled.

In the event that additional cooperation in this case may be helpful to complete its prosecution, the Examiner is cordially invited to contact Applicant's representative at the telephone number written below.

The Commissioner is hereby authorized to charge any insufficient fees or credit any overpayment associated with the above-identified application to Deposit Account 50-2075.

Respectfully submitted,

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